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Steinberg et al.

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(54) **FILTERING CONTENT IN A SOCIAL NETWORKING SERVICE**

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(51) **Int. Cl.**

G06F 3/0482	(2013.01)
G06F 17/30	(2006.01)
H04N 21/454	(2011.01)
H04N 21/4545	(2011.01)
H04N 21/4788	(2011.01)
H04L 29/08	(2006.01)

(52) **U.S. Cl.**

CPC ***G06F 17/30525*** (2013.01); ***G06F 17/30*** (2013.01); ***H04L 67/06*** (2013.01); ***H04L 67/36*** (2013.01); ***H04N 21/454*** (2013.01); ***H04N 21/45457*** (2013.01); ***H04N 21/4788*** (2013.01); *H04L 67/306* (2013.01)

(58) **Field of Classification Search**

CPC G06Q 10/10; H04L 51/32; H04L 12/585; H04L 67/306; H04L 51/12

See application file for complete search history.

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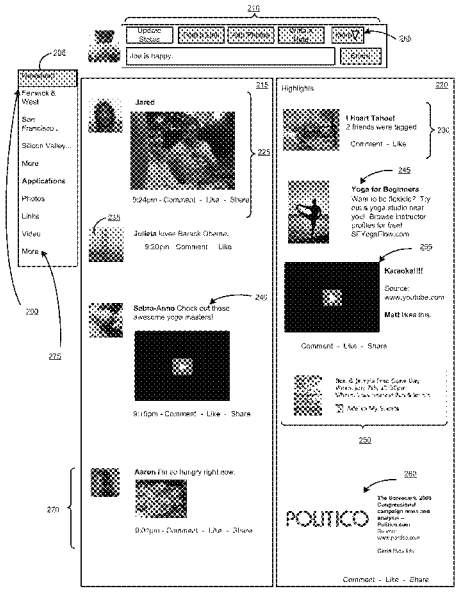
(57) **ABSTRACT**

A social networking service presents information about the social network using multiple feeds in a user interface and provides mechanisms for filtering the content. A content feed includes the most recent content generated by the user's connections, and a highlights feed displays content based on importance and relevance. A user may add content to the social networking service through a composer interface. A user may also filter either or both of the content feed and the highlights feed using a filtering interface, which allows selective filtering of the feeds using one or more different types of filters, including as filtering by the source of the content, friends or networks, and/or content type.

26 Claims, 6 Drawing Sheets



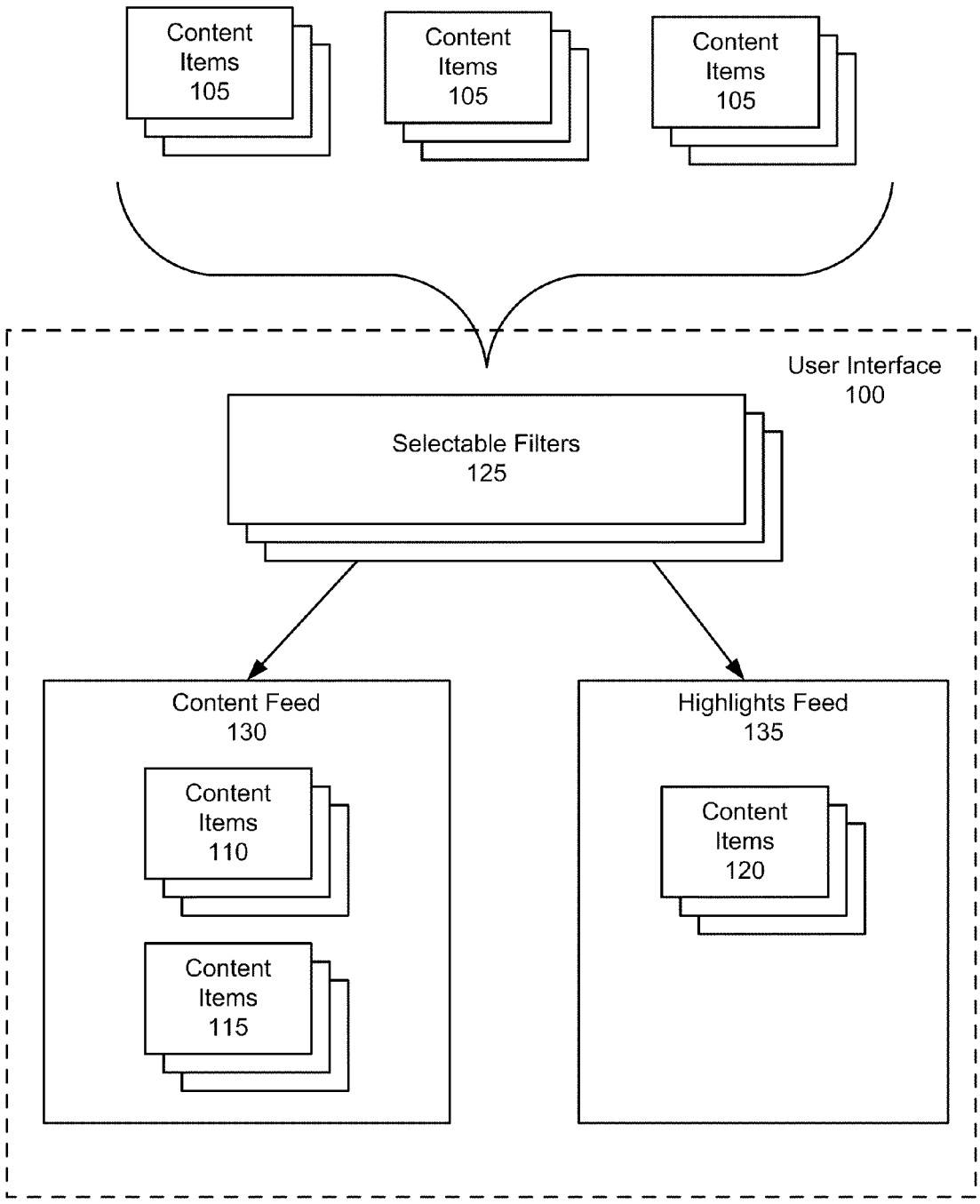

Content Items 105
Content Items 105
Content Items 105
User Interface 100
Selectable Filters 125
Content Feed 130
Content Items 110
Content Items 115
Highlights Feed 135
Content Items 120

FIG. 1

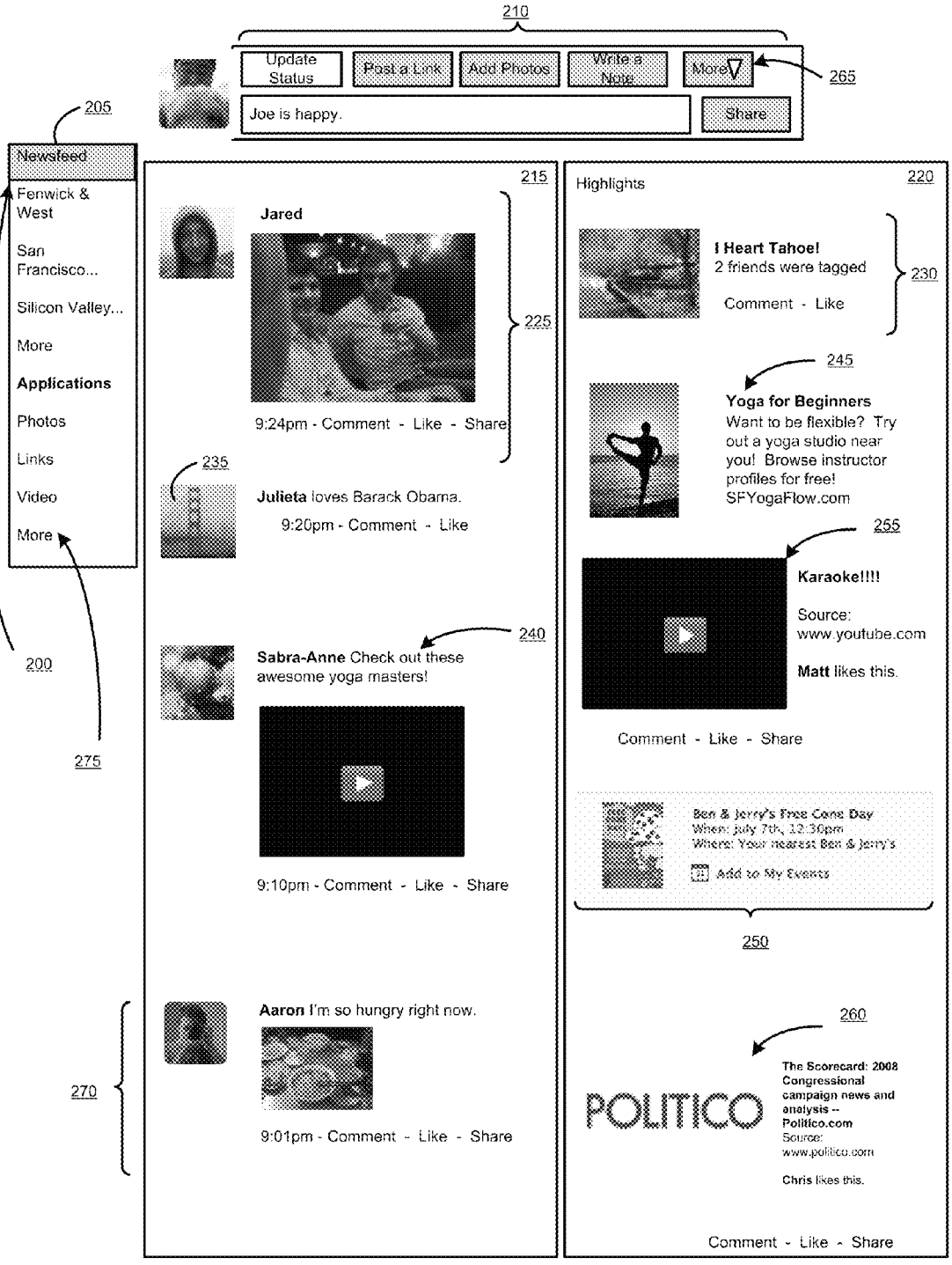

210
Update Status
Post a Link
Add Photos
Write a Note
More
265
Joe is happy.
Share
205
Newsfeed
Fenwick & West
San Francisco...
Silicon Valley...
More
Applications
Photos
Links
Video
More
200
275
215
Jared
225
9:24pm - Comment - Like - Share
235
Julieta loves Barack Obama.
9:20pm - Comment - Like
240
Sabra-Anne Check out these awesome yoga masters!
9:10pm - Comment - Like - Share
270
Aaron I'm so hungry right now.
9:01pm - Comment - Like - Share
Highlights
220
I Heart Tahoe!
2 friends were tagged
Comment - Like
230
245
Yoga for Beginners
Want to be flexible? Try out a yoga studio near you! Browse instructor profiles for free!
SFYogaFlow.com
255
Karaoke!!!!
Source: www.youtube.com
Matt likes this.
Comment - Like - Share
Ben & Jerry's Free Cone Day
When: July 7th, 12:30pm
Where: Your nearest Ben & Jerry's
Add to My Events
250
260
POLITICO
The Scorecard: 2008 Congressional campaign news and analysis -- Politico.com
Source: www.politico.com
Chris likes this.
Comment - Like - Share

FIG. 2

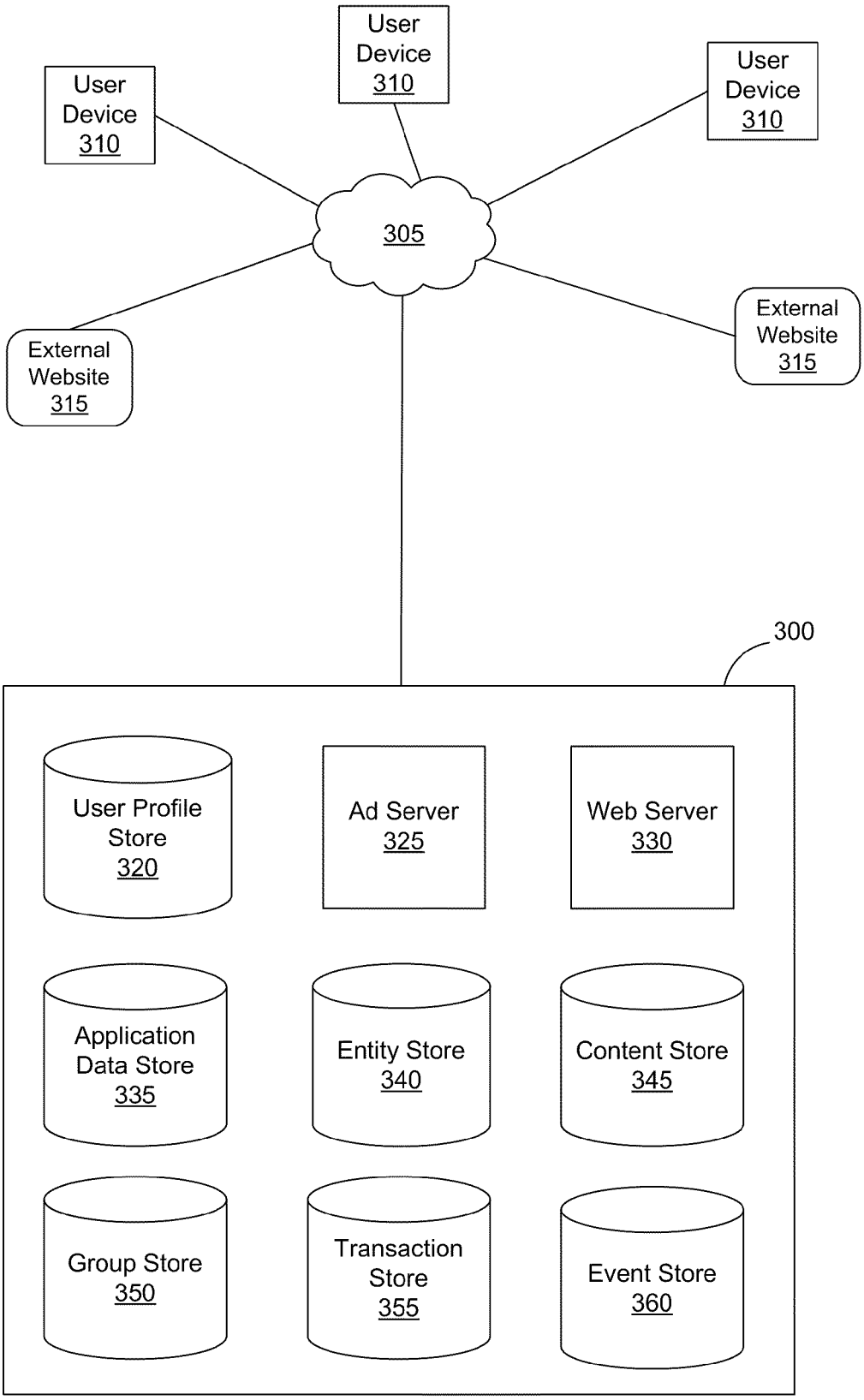

User Device 310
User Device 310
User Device 310
305
External Website 315
External Website 315
300
User Profile Store 320
Ad Server 325
Web Server 330
Application Data Store 335
Entity Store 340
Content Store 345
Group Store 350
Transaction Store 355
Event Store 360

FIG. 3

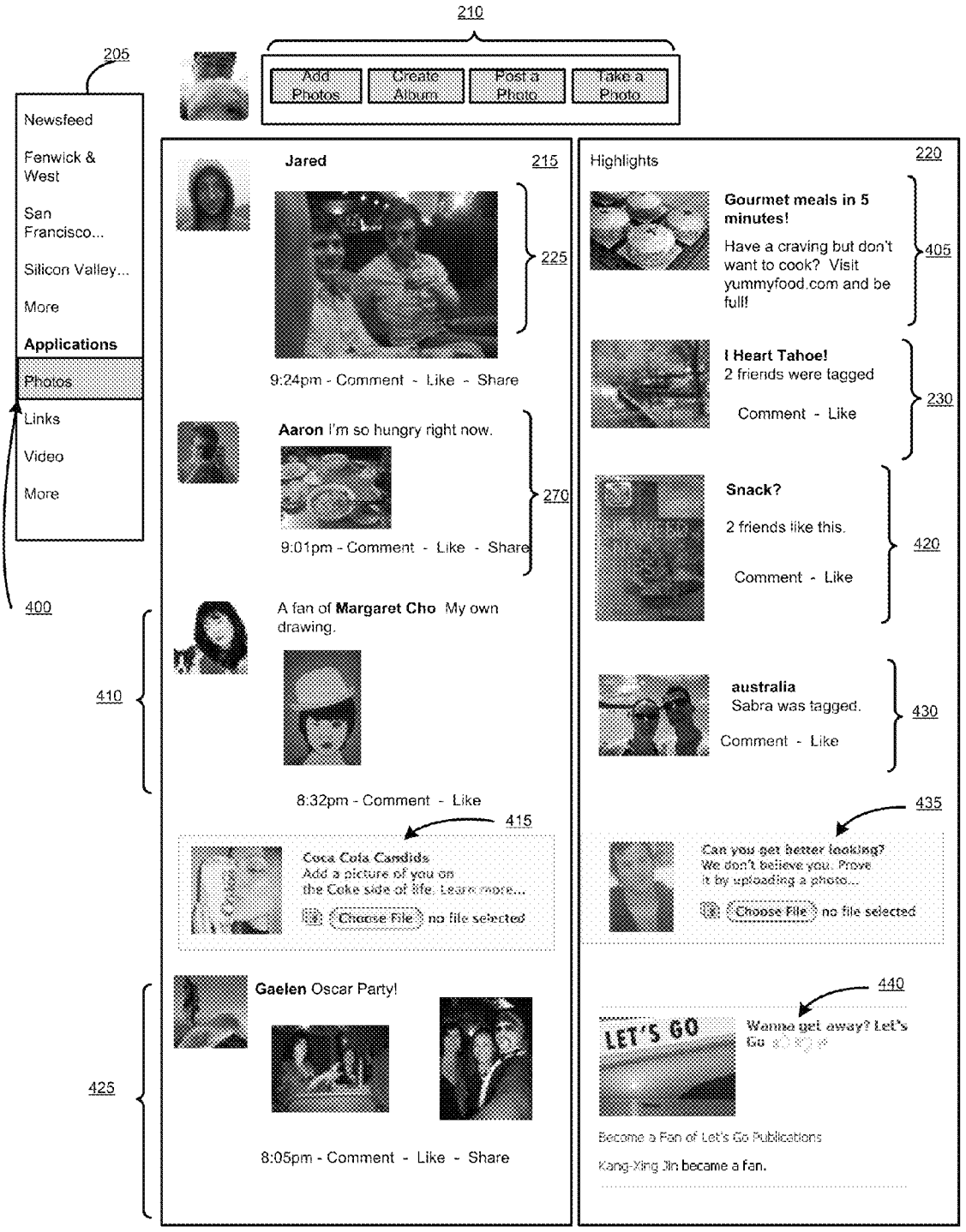

210
205
Add Photos
Create Album
Post a Photo
Take a Photo
Newsfeed
Fenwick & West
San Francisco...
Silicon Valley...
More
Applications
Photos
Links
Video
More
400
Jared
215
225
9:24pm - Comment - Like - Share
Aaron I'm so hungry right now.
270
9:01pm - Comment - Like - Share
A fan of Margaret Cho My own drawing.
410
8:32pm - Comment - Like
415
Coca Cola Candids
Add a picture of you on the Coke side of life. Learn more...
Choose File no file selected
Gaelen Oscar Party!
425
8:05pm - Comment - Like - Share
Highlights
220
Gourmet meals in 5 minutes!
Have a craving but don't want to cook? Visit yummyfood.com and be full!
405
I Heart Tahoe!
2 friends were tagged
Comment - Like
230
Snack?
2 friends like this.
Comment - Like
420
australia
Sabra was tagged.
Comment - Like
430
435
Can you get better looking?
We don't believe you. Prove it by uploading a photo...
Choose File no file selected
440
LET'S GO
Wanna get away? Let's Go
Become a Fan of Let's Go Publications
Kang-Xing Jin became a fan.

FIG. 4

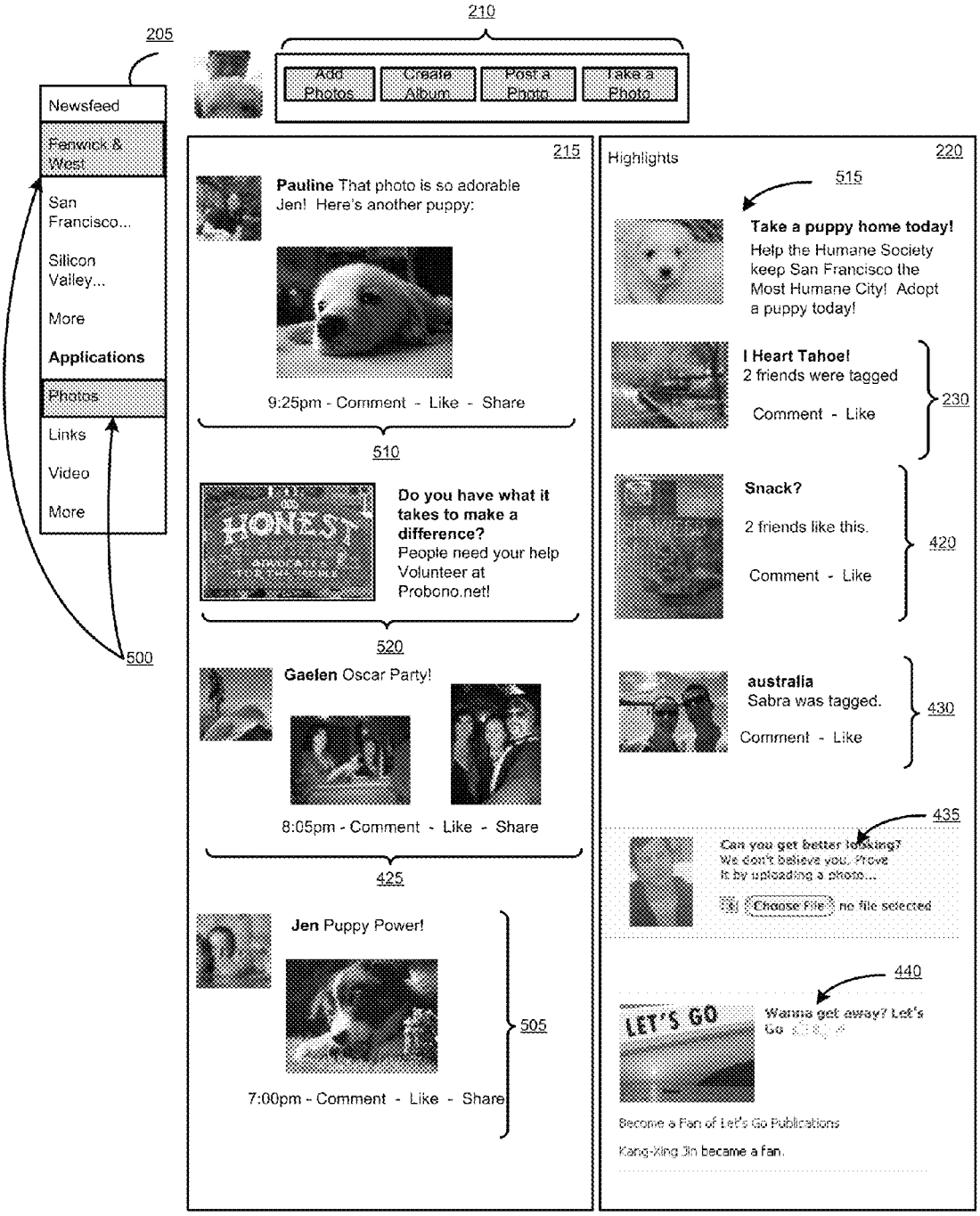

205
210
Add Photos
Create Album
Post a Photo
Take a Photo
Newsfeed
Fenwick & West
San Francisco...
Silicon Valley...
More
Applications
Photos
Links
Video
More
500
215
Pauline That photo is so adorable Jen! Here's another puppy:
9:25pm - Comment - Like - Share
510
Do you have what it takes to make a difference?
People need your help
Volunteer at Probono.net!
520
Gaelen Oscar Party!
8:05pm - Comment - Like - Share
425
Jen Puppy Power!
7:00pm - Comment - Like - Share
505
Highlights
220
515
Take a puppy home today!
Help the Humane Society keep San Francisco the Most Humane City! Adopt a puppy today!
I Heart Tahoe!
2 friends were tagged
Comment - Like
230
Snack?
2 friends like this.
Comment - Like
420
australia
Sabra was tagged.
Comment - Like
430
435
Can you get better looking? We don't believe you. Prove it by uploading a photo...
Choose File
no file selected
440
LET'S GO
Wanna get away? Let's Go
Become a Fan of Let's Go Publications
Kang-Xing Jin became a fan.

FIG. 5

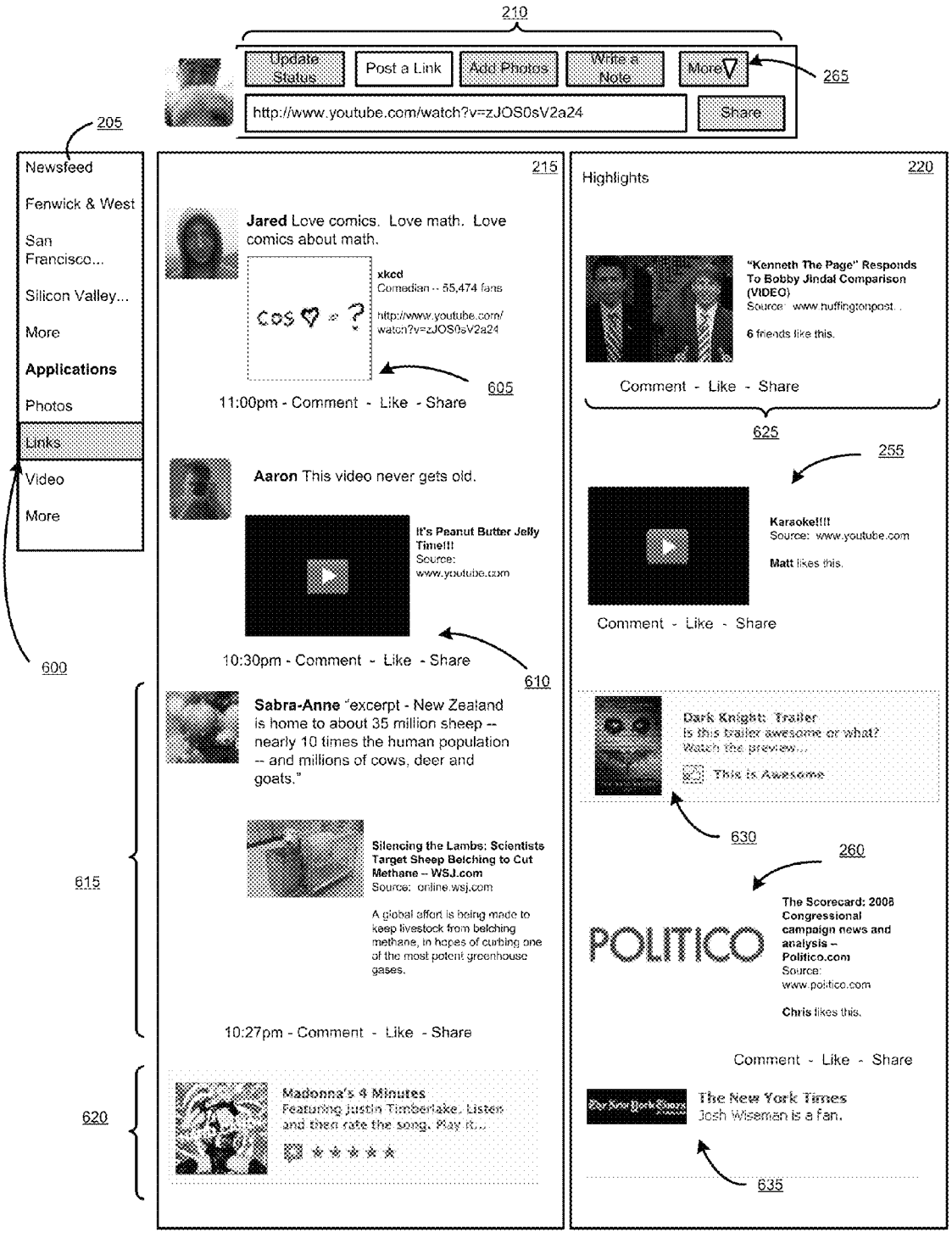

210
Update Status
Post a Link
Add Photos
Write a Note
More
265
http://www.youtube.com/watch?v=zJOS0sV2a24
Share
205
Newsfeed
Fenwick & West
San Francisco...
Silicon Valley...
More
Applications
Photos
Links
Video
More
600
215
Jared Love comics. Love math. Love comics about math.
xkcd
Comedian -- 55,474 fans
http://www.youtube.com/watch?v=zJOS0sV2a24
605
11:00pm - Comment - Like - Share
Aaron This video never gets old.
It's Peanut Butter Jelly Time!!!
Source: www.youtube.com
10:30pm - Comment - Like - Share
610
Sabra-Anne "excerpt - New Zealand is home to about 35 million sheep -- nearly 10 times the human population -- and millions of cows, deer and goats."
Silencing the Lambs: Scientists Target Sheep Belching to Cut Methane – WSJ.com
Source: online.wsj.com
A global effort is being made to keep livestock from belching methane, in hopes of curbing one of the most potent greenhouse gases.
615
10:27pm - Comment - Like - Share
620
Madonna's 4 Minutes
Featuring Justin Timberlake. Listen and then rate the song. Play it...
Highlights
220
"Kenneth The Page" Responds To Bobby Jindal Comparison (VIDEO)
Source: www.huffingtonpost...
6 friends like this.
Comment - Like - Share
625
255
Karaoke!!!!
Source: www.youtube.com
Matt likes this.
Comment - Like - Share
Dark Knight: Trailer
Is this trailer awesome or what?
Watch the preview...
This is Awesome
630
260
POLITICO
The Scorecard: 2008 Congressional campaign news and analysis – Politico.com
Source: www.politico.com
Chris likes this.
Comment - Like - Share
The New York Times
Josh Wiseman is a fan.
635

FIG. 6

FILTERING CONTENT IN A SOCIAL NETWORKING SERVICE

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No. 61/157,505, filed Mar. 4, 2009, which is incorporated by reference in its entirety.

BACKGROUND

This invention relates to social networking and, in particular, to a user interface for viewing content in a social networking service.

Social networking services include social utilities that track and enable connections between users (including people, businesses, and other entities), which have become prevalent in recent years. In particular, social networking services allow users to communicate more efficiently information that is relevant to their friends or other connections in the social networking service. Social networking services typically incorporate a system for connecting users to content that is likely to be relevant to each user. For example, users may be grouped according to one or more common attributes in their profiles, such as geographic location, employer, job type, age, music preferences, interests, or other attributes. Users of the social networking service and/or external parties can then use these groups to customize or target information delivery so that information that might be of particular interest to a group can be communicated to that group.

Because of the amount of information presented, a user may easily be overwhelmed when navigating a social networking service. A user may only visit the social networking service sporadically, in which case unviewed, yet relevant, information about other users may be replaced by more recent information. Retrieving the unviewed, missed content is made more difficult because access to a specific type of content (such as photos) by group, network, or friends is not provided.

Social networking services also paradigmatically provide the most recent and relevant information on its users in a news-reporting style. Instead of a conversational tone, social networking services broadcast news stories using a third person tone of voice, such as "Michael is sleeping" or "Phil posted a link to a video." This is problematic because the tone of voice does not encourage users to engage in a conversation, and it may lead to inefficient information delivery because friends who may be talking about the same topics are unaware of each other's existence.

Furthermore, advertisers wishing to use users' affinities, or common attributes, as targeting criteria for advertisements have difficulty placing their ads in contextually relevant areas, a problem called "ad blindness." As a result, users may be inundated with advertisements for products unrelated to the context of what the users are currently viewing. For example, an advertisement about local barber shops may be targeted to a male demographic, but the advertisement lacks contextual relevance when the user is viewing a video about Yoga. Thus, these ads are largely ignored by users of a social networking service.

SUMMARY

To enhance a user's social networking experience, a social networking service presents content related to a social network using one or more feeds in a user interface. A user interface of the social networking service may allow a user to filter the content displayed in the one or more feeds from the social networking service. Beneficially, this may facilitate the user's consumption of what may be a large amount of content provided by the social networking service.

In one embodiment, the user interface includes a filtering interface that allows a user to filter either or both of the feeds based on various criteria. For example, the filtering interface may enable filtering of one or both of the content feed and highlights feed according to attributes of the content items in each of the feeds. The filtering interface may enable filtering by attributes that include, without limitation: source of the content item (i.e., the friend, entity, or application that created the item), network (i.e., a list or group of friends), and content type. In addition to filtering the content feed, the highlights feed, in one embodiment, may also present content based on the same filtering method selected by the user.

The user interface may also include a content feed, which includes the most recent content generated by other users and entities to which the user is connected, and a highlights feed, which displays various types of information based on importance and relevance to the user. With these two different types of feeds, the user interface enables the social networking service to present the most recently updated content to users while, at the same time, presenting the most relevant content to the user at that moment. In this way, the relevance of content is decoupled from the newness of content (i.e., how recent the content was created) that is presented in the user interface.

The user interface may also include a composer interface, which allows a user to add content to the content feed of other users who are connected to the user. The composer interface encourages the user to engage in a conversation with other users by generating content to the content feed via the composer interface, even while the user is passively viewing information about other users in the social networking service. When used in conjunction with the filtering interface, the composer interface may further encourage the user to generate the same type of content being filtered in the content feed and the highlights feed by presenting tools to generate content in accordance with a type of content selected for the filtering. In one embodiment, the content feed, highlights feed, and composer interface may be linked to the filtering interface via the selected filter.

In one embodiment, the highlights feed presents information to the user that is contextually relevant based on the user's attributes, or affinity, and based on the content currently being viewed by the user. For example, if the user has selected a filter for photos and one of the photos presented in the content feed is a photo from an album called "skydiving," the highlights feed may determine the contextual relevance of skydiving (or another extreme sport) and display content based on that contextual relevance. The highlights feed, in one embodiment, may be displayed in the user interface as a user navigates the social networking service. In one embodiment, the highlights feed contains content that is selected in part based on its relevance of the other content contained in the user interface outside of the highlights feed. For example, if a user is viewing a video showing yoga poses, an advertisement about a yoga class may be selected and shown in the highlights feed.

The features and advantages described in this summary and the following detailed description are not all-inclusive. Many additional features and advantages will be apparent to one of ordinary skill in the art in view of the drawings, specification, and claims hereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a high level conceptual diagram of one embodiment illustrating the filtering of content items into a content feed and a highlights feed.

FIG. **2** is a screenshot of one embodiment showing a content feed, a highlights feed, a composer interface, and a filtering interface.

FIG. **3** is a high level block diagram of the system environment and architecture of a social networking service, according to one embodiment.

FIG. **4** is another screenshot of one embodiment showing a content feed, a highlights feed, a composer interface, and a filtering interface that filters by photos.

FIG. **5** is a screenshot of another embodiment that filters by photos and by a specified network.

FIG. **6** is a screenshot of another embodiment that filters by links.

The figures depict various embodiments of the present invention for purposes of illustration only. One skilled in the art will readily recognize from the following discussion that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles of the invention described herein.

DETAILED DESCRIPTION

Overview of Social Networking Service

A social networking service offers its users the ability to communicate and interact with other users of the service. In use, users join the social networking service and then add connections to a number of other users to whom they desire to be connected. As used herein, the term "friend" refers to any other user to whom a user has formed a connection, association, or relationship via the service. Connections may be added explicitly by a user, for example, the user selecting a particular other user to be a friend, or automatically created by the social networking service based on common characteristics of the users (e.g., users who are alumni of the same educational institution). Connections in social networking services are usually in both directions, but need not be, so the terms "user" and "friend" depend on the frame of reference. For example, if Bob and Joe are both users and connected to each other in the service, Bob and Joe, both users, are also each other's friends. The connection between users may be a direct connection; however, some embodiments of a social networking service allow the connection to be indirect via one or more levels of connections. Also, the term friend need not require that users actually be friends in real life, (which would generally be the case when one of the users is a business or other entity); it simply implies a connection in the social networking service.

In addition to interactions with other users, the social networking service provides users with the ability to share content items generated on the service or on an external service or website. These content items may include groups or networks (where "networks" here refer not to physical communication networks, but rather social networking services of people) to which users of the service may belong, events or calendar entries in which a user might be interested, computer-based applications that a user may use via the service to generate content, and transactions that allow users to buy or sell items via the service. These are just a few examples of the items that a user may share on a social networking service, and many others are possible. A social networking service, thus, may be alternatively described as a plurality of interconnected nodes, where nodes refer to the users, entities, and content items existing on the social networking service.

Navigating a social networking service, especially when a user has hundreds, or even thousands of friends, can be daunting due to the sheer amount of information available to the user within these content items. "Content," as used herein, refers also to "content segments" and "content items" in addition to "user-generated content." Actions performed by the other users of the social networking service, including sharing and posting content to a "wall," are visible to the user as "stories" about the actions performed. Content, therefore, includes these stories about actions taken by other users of the social networking service.

Generating content includes uploading songs, videos, photos, and text using computer-based applications that publish the content to the social networking service. The term "user-generated content" also describes this content because users generate the content using the computer-based applications available on the social networking service. Content may be posted to a user's wall by a friend or connection of the user. In addition, a user may post content to the user's own wall. Other types of content, such as GPS applications that provide a user's location coordinates in real-time, as well as games and other third-party applications on the social networking service, may be generated by the user or any authorized user.

Content on a social networking service may further include advertisements from users of the social networking service. Because users of the social networking service also include non-physical entities such as businesses and organizations and because groups of users often generate walls of content as well, the content delivered to a particular user navigating the social networking service must be filtered due to the enormity of information and content being generated by users, or, more generally nodes, of the social networking service.

Delivery of the most relevant information requires algorithms to filter the raw content on the network. Content is filtered based on the attributes in a user's profile, such as geographic location, employer, job type, age, music preferences, interests, or other attributes. "Newsfeed stories" may be generated to deliver the most relevant information to a user based on a ranking of the generated content, filtered by the user's affinity, or attributes. Applying this algorithm, newsfeed stories present the user with the most recent and most relevant content available on the social networking service.

This information delivery approach, while effective in conveying useful information, presents a challenging problem for users of the social networking service. In order to "keep up" with the friends and connections made on the social networking service, a user must regularly visit the social networking service; otherwise, the user would miss relevant information that expires as more recent and relevant information is posted by other users. Thus, this filtering approach does not provide the user access to all of the relevant information on the social networking service because older information, though relevant, is constantly being replaced by newer information. The filtering approach further does not enable the user to manually distill the raw information that is available on the social networking service because the filtering approach relies on the newsfeed generation algorithm described in a related application, "Communicating Information in a Social Networking Website About Activities from Another Domain," U.S. Ser. No. 12/193,705 hereby incorporated by reference.

In addition, the newsfeed stories present content in a third party voice, much like a news reporting service. For example, a newsfeed story would state that "Michael posted a video" and include a video application frame through which a user

could view the video. Although this vantage point of the social networking service effectively presents the information on the network, the user experience is diminished because a third party voice presents the information in a cold and detached manner. Thus, the newsfeed's third party voice may not encourage a user to take action within a social networking service as much as a more personal tone of voice.

Overview of Filtering the Content Feed and Highlights Feed

FIG. **1** depicts a high level conceptual diagram of the invention according to one embodiment. A user interface **100** through which a user may view content generated by other users of a social networking service is illustrated. Content items **105** are received by the user interface **100**. Other users in the social networking service generate the content items **105** and a user of the social networking service may subscribe to other users, allowing the subscribing user to view the content items generated by the other users. Being "subscribed" to a particular user, in this context, informs the social networking service of the subscribing user's interest in the particular user's feed of content items. In one embodiment, a user's connections to other users of the social networking service automatically subscribe the user to his or her connected users.

The user interface **100** comprises selectable filters **125**, a content feed **130**, and a highlights feed **135**. A user may select a filter **125** to view a subset of the content items **105** available for display in the user interface **100**. Each of the selectable filters **125** specifies a criteria to be applied to the received content items **105**.

The filter **125** identifies, of the content items **105** to be displayed, particular content items **110** and **115** that will appear in the content feed **130**. The particular content items **110** and **115** are consistent with the criteria specified by the filter **125**. In one embodiment, the content items **110** and **115** appear in chronological order in the content feed **130**.

Similarly, the filter **125** may also identify, of the content items **105** to be displayed, particular content items **120** that will appear in the highlights feed **135**. The particular content items **120** are consistent with the criteria specified by the filter **125**. In another embodiment, the content items **120** appear in order of relevancy to the filter **125**. In this way, older content items **105** that were received further back in time, but relevant to the filter **125**, may be viewed in the user interface **100**.

FIG. **2** illustrates a layout of one embodiment of a user interface for a social networking service using a content feed **215** and a highlights feed **220**, corresponding to the content feed **130** and highlights feed **135** of the conceptual diagram illustrated in FIG. **1**. A filtering interface **205** is displayed to indicate that the interface is set **200** to "Newsfeed," meaning that no filters are turned on. In this embodiment, the filters **205** allow all content from all applications and all networks to be presented. A composer interface **210** is also displayed to enable the user to add, or upload, content to the social networking service. Using the composer interface **210**, a user may update his status, post a link, add photos, and write a note. These actions are provided for illustration purposes only as more actions **265** are available to perform via the composer interface **210**. Applications are also listed in the filtering interface **205**. By selecting one of the applications, a user may filter content by photos, links, and video. The user may also filter by more applications **275** available by selecting "More." A popup window would appear in which the user could select more applications to filter. Thus, content generated by applications can be filtered so that a user can easily view that content.

Content Feed

The content feed **215** presented to the user in FIG. **2** displays the most recently posted content and related actions performed by friends and connections on the social networking service. For example, the content feed **215** shows, in reverse chronological order, that a friend added a new photo **225**. Another friend posted a status update **235**. Yet another friend uploaded a video **240** related to Yoga. And another friend uploaded a photo **270** about food.

Because no filters have been specified **200** in the filtering interface **205**, the content feed **215** displays all types of content available on the network from friends and connections of the user in reverse chronological order. As a result, the content feed is more deterministic because the content displayed in the content feed **215** reflects exactly what content is being posted on the social networking service in real-time.

The content feed **215** is presented in the first person voice. Each content segment identifies the name of the actor, a message by the actor, and is followed by the attached media. For example, a friend named "Jared" added a photo that is shown in content segment **225**. Underneath the photo is a timestamp and options to "comment," "like," or "share" the photo. Other actions not listed are also available, such as attaching other types of media content. In the content segment **225**, "Jared" did not include a message, but only shared a photo. However, the photo generated by Jared shares non-verbal information with the user viewing the content feed **215**. In this way, the content feed **215** encourages a conversational way of content sharing. Instead of reporting passive actions, the content feed delivers content to the user in a first person voice.

The user can engage in a conversation by attaching content to content segments of the content feed **215**. As mentioned above, generating content may include text, audio, video, or any other user-generated content that can be uploaded to the social networking service. Alternatively, the user can generate content in the content feed **215** using the composer interface **210**.

The content feed **215** is linked to the filtering interface **205** to enable the user to filter the raw content based on various combinations of filters **200**. The content feed **215** shows only the qualifying content by applying the filters selected by the user to the raw content. In this way, the user may refine the display of content in the content feed **215** using the filters available on the social networking service.

The content feed **215**, in one embodiment, also enables users to follow friends that they want to hear from more regularly and ignore other friends that may share too much information. This feature helps a user who may have large numbers of friends, but who may really want to only interact with a smaller subset of those friends. One option, in one embodiment, is for the social networking service to automatically filter down the list of friends that a user is "following" in the content feed to include only friends for which the user has a high affinity, while excluding friends that the user identifies as sharing too much information in the user's content feed **215**. In this context, the term "following" means the act of directing a friend's generated content to be included into a user's content feed **215**. A user can follow a friend or another user of the social networking service in a variety of ways, such as by expressly adding the other user to the content stream, or the social networking service may add the other user without an express request based, for example, on actions by the user indicating an interest.

Another option is for the user to manually create "friend lists," or user-defined lists of users to which the user is connected, in order to define the smaller subset of friends that the

user wants to view content from in the content feed **215**. In this way, a user may manually adjust the friends that she is following to include or exclude friends based on her preferences. For example, if a user has 1000 friends, she probably only interacts with 25 friends on a regular basis. Interactions may include, but are not limited to, clicking on the "like" feature of a friend's posted content, commenting on a friend's posted content, sharing a friend's posted content with the user's other friends, writing on a friend's wall, and using other applications to interact with a friend. Numerous interactions result in a higher affinity for a friend. Thus, for example, the user may initially be following only 25 friends of her friends in the content feed **215** because the social networking service automatically filtered her content feed **215** by affinity for friends. Additionally, she may manually adjust who she is following to include other friends or exclude friends whose content she doesn't want to view by defining groups of friends, or friend lists, to be used by the filtering interface described above. By excluding, or ignoring, these friends, she is not severing the connection in the social networking service, but merely focusing her content feed **215** to only include content from the friends she wants to hear from the most.

Highlights Feed

Also in FIG. **2**, a highlights feed **220** presents the most relevant content to the user where the relevancy is based on an affinity score and a decay factor used in the newsfeed generation algorithm described above. The highlights feed **220** displays content, or a preview of the content, generated by users in the social networking service. Content may further comprise stories about actions taken by other users of the social networking service. The highlights feed **220** ranks the content according to the affinity score and the content will expire based on the decay factor. Thus, if a user has a high affinity for photos, videos, and links, more of that type of content will be displayed in the highlights feed **220**. Additionally, a user may also want to view the content posted by a selected number of friends, based on the user's personal configuration of these preferences or the newsfeed generation algorithm's determination of these preferences. Thus, although the highlights feed **220** implements the same newsfeed generation algorithm, the highlights feed **220** presents content in a ranked order based on importance/relevance only. Content is presented without regard to its history. As a result, relevant content that may be interesting to a user is shown in the highlights feed **220**.

Additionally, the highlights feed **220** may, in an alternative embodiment, include the "following" feature included in the content feed **215**, described above. This would limit the display of content that appears in the highlights feed **220** to only the content generated by friends that the user is following.

In FIG. **2**, the highlights feed **220** displays a preview of a photo album **230** in which two friends were tagged. An advertisement about yoga is displayed in segment **245**. A video that a friend likes is displayed in segment **255**. Next, an advertisement **250** about an event giving out a free ice cream cone is displayed with a request to add the event to the user's calendar is displayed. Finally, a link **260** to a news story regarding politics is shown. The display of these segments in the highlights feed **220** does not report that a particular friend posted the content. Rather, the relevance of the content and a preview of the content itself, along with a social aspect of the content (the number of friends that like the content, names of friends who like the content) is displayed. In this way, less information is given, enabling the user to glance over the highlights feed **220** to determine if anything is interesting. Thus, the focus is on the content, not the user who posted the content.

The highlights feed **220** is also distinguishable from the newsfeed because the highlights feed **220** displays contextually relevant content throughout the social networking service by displaying information that is related to what is currently being viewed by the user on the social networking service. For example, in the content feed **215**, a status update **235** is displayed. The highlights feed **220** displays the contextually relevant content segment **260** that relates to a link about a political news story **260**. User-generated content posted by a friend, such as the link to the news story relating to politics **260**, is presented in the highlights feed **220** because it is relevant to the political status update **235** displayed in the content feed **215**. Another example of the highlights feed **220** presenting contextually relevant content is, in response to a video **240** uploaded by a friend relating to yoga masters, an advertisement **245** is displayed in the highlights feed **220** that relates to finding a yoga studio in San Francisco (presumably one of the networks which the user has joined). Thus, content with attributes matching the attributes of the currently viewable content will appear in the highlights feed **220**.

In addition, the highlights feed **220** sorts content segments based on the overall score on an absolute basis. Content segments may appear in a higher or lower position as they are determined to be more or less interesting. For example, if a photo receives numerous comments, it might climb in ranking. However, once the comments start to expire, meaning that the comments are getting older, the photo would fall downwards in the rankings By decoupling relevant content from time sensitive content, the user interface enables users to view more relevant content that is interesting.

System Architecture

FIG. **3** is a high level block diagram illustrating a system environment suitable for operation of a social networking service **300**. The system environment comprises one or more user devices **310**, one or more external websites **315**, a social networking service **300**, and a network **305**. In alternative configurations, different and/or additional modules can be included in the system.

The user devices **310** comprise one or more computing devices that can receive user input and can transmit and receive data via the network **305**. For example, the user devices **310** may be desktop computers, laptop computers, smart phones, personal digital assistants (PDAs), or any other device including computing functionality and data communication capabilities. The user devices **310** are configured to communicate via network **305**, which may comprise any combination of local area and/or wide area networks, using both wired and wireless communication systems.

FIG. **3** also illustrates a block diagram of the social networking service **300**. The social networking service **300** includes a web server **330**, an ad server **325**, a user profile store **320**, an entity store **340**, an application data store **335**, a transaction store **355**, a content store **345**, an event store **360**, and a group store **350**. In other embodiments, the social networking service **300** may include additional, fewer, or different modules for various applications. Conventional components such as network interfaces, security mechanisms, load balancers, failover servers, management and network operations consoles, and the like are not shown so as to not obscure the details of the system.

The social networking service **300** comprises a computing system that allows users to communicate or otherwise interact with each other and access content as described herein. The social networking service **300** stores user profiles that describe the users of a social networking service, including biographic, demographic, and other types of descriptive information, such as work experience, educational history,

hobbies or preferences, location, and the like. Additionally, the social networking service **300** includes user-defined connections between different users, allowing users to specify their relationships with other users. For example, these user defined connections allows users to generate relationships with other users that parallel the users' real-life relationships, such as friends, co-workers, partners, and so forth. Users may select from predefined types of relationships, or define their own relationship types as needed.

A user (or other type of node) may have a particular affinity, which may be represented by an affinity score, for another node on a social networking service. In this context, an affinity score indicates the strength of correlation or interest between a user and another node in the social networking service. Affinity scores for a user's connections are stored in the user profile object for that user in the user profile store **320**. As indicated above, a node may be a user, entity, or any other object with which a user may engage and interact on a social networking service. Methods for determining affinities between users of a social networking service are described further in U.S. application Ser. No. 11/503,093, filed Aug. 11, 2006, which is hereby incorporated by reference in its entirety.

The social networking service **300** maintains data in a database about a number of different types of objects with which a user may interact on the social networking service **300**, including content items, entities, events, applications, groups, and transactions. To this end, each of the user profile store **320**, the content store **345**, the entity store **340**, the event store **360**, the application data store **335**, the group store **350**, and the transaction store **355** stores a data structure in a database to manage the data for each instance of the corresponding type of object maintained by the website **300**. The data structures comprise information fields that are suitable for the corresponding type of object. (For example, the event store **360** includes data structures that include the time and location for an event, whereas the user profile store **320** includes data structures with fields suitable for describing a user's profile.) When a new object of a particular type is created, the service **300** initializes a new data structure of the corresponding type, assigns a unique object identifier to it, and begins to add data to the object as needed. This might occur, for example, when a user uploads a new content item, wherein the social networking service **300** would generate a new instance of a content item in the content store **345**, assign a unique identifier to the event, and begin to populate the fields of the event with information provided by the user and, subsequently as the content item is posted, by users interacting with the content item.

An ad server **325** generates and delivers advertisements to user devices **310**. In one embodiment, an ad server **325** may access the various filters created by users and/or automatically created by the social networking service **300**. An analysis of the filters may help advertisers develop better marketing campaigns through more selective targeting techniques utilizing information about users' preferred filters. Targeting advertisements are further described in a related application, U.S. application Ser. No. 12/195,321, filed Aug. 20, 2008, which is hereby incorporated by reference in its entirety.

The web server **330** links the social networking service **300** via the network **305** to one or more user devices **310**; the web server **330** serves web pages, as well as other web-related content, such as Java, Flash, XML, and so forth. The web server **330** may include a mail server or other messaging functionality for receiving and routing messages between the social networking service **300** and the user devices **310**. The messages can be instant messages, queued messages (e.g., email), text and SMS messages, or any other suitable messaging technique. In another embodiment, the social networking service is implemented on an application running on a user device **310** that accesses information from the social networking service using APIs or other communication mechanisms.

Other Filtering Scenarios

FIG. **4** illustrates the content feed **215** after the user selected **400** a photo filter via the filtering interface **205**. The photo filter **400** enables the user to view all user-generated content posted by friends and connections related to photos in reverse chronological order. As shown in FIG. **4**, the segments **225** and **270** related to photos in FIG. **2** are displayed in the content feed **215**. Further, a fan posted a photo **410** on a fan page that the user is also a fan of, thus qualifying the content to be displayed in the content feed **215**. Even though the fan may not be a direct friend or connection to the user, the user's connection to the fan page enables this content to be displayed in the content feed **215**. An advertisement **415** that requests the user to upload a photo to the social networking service regarding a promotion is also presented to the user in the content feed **215**. Finally, photos uploaded by a friend using a mobile device **425** are also presented to the user via the content feed **215**.

FIG. **5** illustrates the content feed **215** after the user, having already selected a photo filter **400** in FIG. **4**, selects another filter **500** to filter by network in an alternative embodiment. Older content segment **505** appears near the end of the content feed **215**. In this case, a friend initially posted the content segment **505** displaying a photo of a puppy. In response, a friend of the friend responded to the content segment **505** by adding her own photo of another puppy **510**. The user may decide to post a photo or generate other content in the content segment **505**. Or, he can generate content that is separate from the content segments **505** and **510** by using the composer interface **210** to add content to the content feed **215**. Another advertisement **520** is displayed in the content feed **215** that is targeted to lawyers because the selected network filters **500** include a filter by a law firm's network. FIG. **6** similarly depicts a content feed **215** that filters by links and is discussed in more detail below.

The content feed **215** may be filtered by any combination of network, group, application, and by content type while the newsfeed can only be filtered by one method at a time and some filters available to the content feed **215** are not available to the newsfeed. In one embodiment, the content feed **215** may use a filter by friends (i.e., filter by group) or dynamic (i.e., filter by network). Because users determine the networks to which they belong, a filter by network enables a user to filter by a group of friends that does not need to be maintained. Finally, the user may engage in a conversation with other users and friends in the social networking service because content is delivered to the user in the first person voice. By attaching content to posted content in the content feed **215** or adding content via the composer interface **210**, a user can easily engage in a conversation with other users of the social networking service in the content feed **215**. The conversation may be in the form of text, audio, visual, or any other user-generated content that can be uploaded to the social networking service. In this way, a content-based conversation occurs in the content feed **215**.

Returning now to FIG. **4**, in which the content filter **400** has been specified to filter for photos, the highlights feed **220** also displays contextually relevant content. For example, the highlights feed presents an advertisement **405** relating to gourmet food delivery in response to a segment in the content feed **215** that displayed a photo **270** relating to hunger. In this embodi-

ment, content in the highlights feed **220** is contextually relevant in that it relates to content in the content feed **215**. In this way, advertisers may place advertisement in contextually relevant areas on the social networking service, thus eliminating "ad blindness." In addition, a user can quickly view the posted content of their friends and connections using the highlights feed **220**. Thus, the highlights feed **220** displays contextually relevant content, dependent on the shared attributes of the two content items (gourmet food and hunger).

As shown in FIG. **4**, the highlights feed presents an advertisement **405** relating to gourmet food to the user. The preview of the photo album **230** remains in the highlights feed **220** from FIG. **2** because the photo album **230** qualified under the selected filter. Next, a photo **420** which **2** friends like is shown in the highlights feed **220**. A photo album **430** in which Sabra was tagged is also displayed in the highlights feed **220**. Next, an advertisement **435** requesting the user to upload a photo is displayed. Finally another advertisement **440** relating vacations is displayed in the highlights feed **220**.

Similarly in FIG. **5**, the highlights feed **220** continues to display contextually relevant items. Many of the same segments shown in FIG. **4** are also shown in FIG. **5** because the user selected a filter by network. The segments that are shown in the both FIGS. **4** and **5** are photo content shared by friends in the Fenwick & West network. Additionally, because photo content related to puppies in content segments **505** and **510** is viewable, an advertisement **515** appears in the highlights feed **220** that advertises a local puppy shelter.

The highlights feed **220** is also linked to the filtering interface **205** in the same way as the content feed **215**. For example, if the user selected a filter by network, both the highlights feed **220** and the content feed **215** would only display content from friends and connections in the selected network. In this way, the highlights feed **220** presents the most relevant content posted by friends and connections in the selected network. As mentioned above, an advantage of this type of filtering method is that, because users choose to opt-in or opt-out of a network, the network is not managed by a single entity, but rather by the users opting to be in a certain network. Thus, a user can view both the most recent content posted on the social networking service via the content feed **215** and the most relevant content posted on the social networking service via the highlights feed **220** as filtered by a network that is decentralized because membership management of the selected network is performed by the individual users of that network, rather than centrally managed by one entity.

In sum, the highlights feed **220** displays contextually relevant content throughout the social networking service. Content items are not time sensitive and will not expire or be replaced by newer items, but instead are ranked by importance/relevance as determined by the shared attributes of the user's profile and the content items. In addition, the content is featured in the highlights feed **220** surfaces, in one embodiment, due to the social context (such as when multiple friends post the same link to a video). Thus, content is shared based on its relevance based on how popular a content item may be in the social networking service, or by the user's affinity for the content item.

Filtering Interface and Composer Interface

Filtering interface **205** provides the user with options to filter the content in the content feed **215** and the highlights feed **220**. Multiple filters can be used to pinpoint the type of content and information that the user wishes to view. FIG. **4** illustrates one filter selected to display only photos. FIG. **5** displays filters **500** that display content related to friends in a specified network as well as limiting the type of content to photos. As a result, the first segment **225** shown in the content feed **215** of FIG. **4** disappears in FIG. **5** because, in this example, Jared is not a user of the Fenwick & West network. The rest of the content that was displayed in the content feed **215** in FIG. **4** shifts up in FIG. **5** allowing older content segment **505** to be displayed. The highlights feed **220** remains basically unchanged from FIG. **4** to FIG. **5** because the friends listed in the highlights feed **220** happen to all be a part of the selected network filter. However, the advertisement **515** now displays an ad about a puppy shelter in response to the older content segment **505** becoming viewable.

The composer interface **210** is also linked to the filtering interface **205**. If the user selects a filter by application or by content type, the composer interface **210** displays content generating tools related to the selected application/content filter. If, on the other hand, the user selects a filter by network, the composer interface **210** is not affected because the network filter only relates to grouping of the user's friends, not the content generated by the friends. Thus, the composer interface **210** would display the same content generating tools as in FIG. **4** after a user selects a network filter in FIG. **5**.

The filtering interface **205** is also linked to the composer interface **210**, as well as the content feed **215** and highlights feed **220**. For example, a user might decide to post a link using the composer interface **210**. After selecting the "Post a Link" button in the composer interface **210**, in one embodiment, the filtering interface may be automatically configured to filter the content feed **215** and the highlights feed **220** to filter by Links, as shown in FIG. **6**. By linking the composer interface to the filtering interface in this way, the user can quickly see if one of his friends or connections recently posted the same link to the service in the content feed **215**, or if the link showed up in the highlights feed **220** due to its relevance. This linkage between the composer interface **210** and the filtering interface **205** to automatically filter the content feed **215** and highlights feed **220** by content or by application type is not limited to the actions depicted in the figures (update status, post a link, add photos, and write a note) but also includes more actions **265** that are configurable by the user.

Other Embodiments

As shown in FIG. **4**, if a user wanted to view the most recent photos uploaded by friends, the user would select a filter **400** to view photos only in the filtering interface **205**. The content feed **215** would then present all the photos that have been uploaded recently. Simultaneously, the highlights feed **220** would also display photos which have been determined to be the most relevant to the user based on an affinity score and decay factor, in one embodiment. The composer interface **210** presents the user with ways of uploading content consistent with the selected filter, in this case, a photo content type filter. Thus, the user is provided with ways to the content feed by adding photos, creating a photo album, posting a photo, and even taking a photo with a camera device attached.

FIG. **5** illustrates another filter, one by friends, applied to received content items in content feed in addition to the photo filter in FIG. **4**. Thus, a user can specify that only content related to photos generated by friends and connections in the Fenwick & West network should be displayed in the content feed **215** and highlights feed **220**.

FIG. **6** illustrates another embodiment of navigating a social networking service using a content feed **215** and a highlights feed **220** in which the filtering interface **205** is configured to show links, which are URLs of external websites that friends and connections on the social networking service have posted. The content feed **215**, updated in real time in one embodiment, presents links that have been posted by friends in reverse chronological order. A friend posted a

link to a fan page **605**. A friend posted a link to a video **610**. Another friend posted a link to a news story **615**. And finally, an advertiser promotes a new song by placing an ad **620** in the content feed **215**. Note that any advertisement can be placed in a content feed in which filters have been configured to display links only because users selecting to view content by links are inclined to clicking on links in rapid succession. Thus, a user might mistake a sponsored ad for a link that was posted by one of his friends. In effect, placement of ads in either the content feed **215** or the highlights feed **220** under these circumstances becomes very valuable to almost any advertiser.

Additionally, although only links are being displayed in the content feed **215** in FIG. **6**, the content feed **215** still emulates a conversation because the friend posting the content makes a comment about the link being posted. Thus, regardless of the type of content being displayed in the content feed **215**, the structure of each content segment remains in the first person voice.

FIG. **6** also illustrates highlights feed **220** that presents links that are most relevant to the user and links that are contextually relevant to content that is currently being viewed on the page. For example, a link to a blog post **625** that multiple friends have posted is displayed first because it is probably most relevant due to the number of friends that posted the link. Another friend's posted link to a video **255**, which is less relevant based on the affinity score and decay factor, is displayed next. An advertisement **630** relating to an upcoming movie is inserted in the highlights feed. Next, another friend's posted link **260** is displayed. A user selecting to filter by links is in the mood to click on interesting headlines that are either most recent (in the content feed **215**) or most relevant (in the highlights feed **220**). Finally, a link **635** to a fan page, The New York Times, is displayed in the highlights feed **220**.

FIG. **6** also shows how easily the user can post a link. Using the composer interface **210**, which has been modified to prepare the user to post a link, the user may simply enter a URL into the field and then the user may preview the post before actually posting the link. The preview may appear as a pop-up window that allows the user to comment on the link, thereby creating user-generated content in the form of the user's personal reflection or opinion of the link. As shown throughout the content feed **215**, these personal reflections on the links posted simulate a conversational way of sharing content. Alternatively, the user can choose to comment or share any of the posted links that appear in the content feed **215** and highlights feed **220**. Thus, both ways of generating links contribute to a conversational way of communicating on the social networking service.

Although filtering content items has been described thus far in the context of web pages of a social networking service, filtering content items into one or more feeds may be implemented using various communication mechanisms, such as mobile APIs, a comment box on external websites, SMS text messaging, notifications, email, among others. As a result, delivery of information to users of a social networking service may comprise multiple communication mechanisms, making the filtering methods described herein very valuable and beneficial to enhancing the user experience of the service.

Summary

The foregoing description of the embodiments of the invention has been presented for the purpose of illustration; it is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Persons skilled in the relevant art can appreciate that many modifications and variations are possible in light of the above disclosure.

Some portions of this description describe the embodiments of the invention in terms of algorithms and symbolic representations of operations on information. These algorithmic descriptions and representations are commonly used by those skilled in the data processing arts to convey the substance of their work effectively to others skilled in the art. These operations, while described functionally, computationally, or logically, are understood to be implemented by computer programs or equivalent electrical circuits, microcode, or the like. Furthermore, it has also proven convenient at times, to refer to these arrangements of operations as modules, without loss of generality. The described operations and their associated modules may be embodied in software, firmware, hardware, or any combinations thereof.

Any of the steps, operations, or processes described herein may be performed or implemented with one or more hardware or software modules, alone or in combination with other devices. In one embodiment, a software module is implemented with a computer program product comprising a computer-readable medium containing computer program code, which can be executed by a computer processor for performing any or all of the steps, operations, or processes described.

Embodiments of the invention may also relate to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, and/or it may comprise a general-purpose computing device selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a tangible computer readable storage medium or any type of media suitable for storing electronic instructions, and coupled to a computer system bus. Furthermore, any computing systems referred to in the specification may include a single processor or may be architectures employing multiple processor designs for increased computing capability.

Embodiments of the invention may also relate to a computer data signal embodied in a carrier wave, where the computer data signal includes any embodiment of a computer program product or other data combination described herein. The computer data signal is a product that is presented in a tangible medium or carrier wave and modulated or otherwise encoded in the carrier wave, which is tangible, and transmitted according to any suitable transmission method.

Finally, the language used in the specification has been principally selected for readability and instructional purposes, and it may not have been selected to delineate or circumscribe the inventive subject matter. It is therefore intended that the scope of the invention be limited not by this detailed description, but rather by any claims that issue on an application based hereon. Accordingly, the disclosure of the embodiments of the invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

What is claimed is:

1. A method comprising:

receiving by a social networking service a plurality of content items from users of the social networking service;

receiving, from the users of the social networking service, user profile attributes comprising descriptive information about each user;

automatically creating, by a processor, groups relevant to a user according to one or more rules, the groups comprising users of the social networking service having one or more common user profile attributes in common with the user;

providing one or more of the content items for presentation to the user in a user interface,

wherein the user interface comprises:

a content feed that includes a subset of the content items provided by other users,

a highlights feed that includes a subset of content items selected by the social networking service as a function of affinity scores between the user and other users of the social networking service associated with content items included in the highlights feed, and

one or more selectable filters generated by the social networking service for the user, each filter specifying one or more of the automatically created groups of users;

receiving, from the user, a selection of a filter of the one or more selectable filters, the selected filter associated with one or more groups of users; and

responsive to the selection of the filter, sending for presentation to the user in the user interface updated subsets of content items for the content feed and the highlights feed, the updated subsets including only those content items received from the users in the one or more groups of users associated with the selected filter.

2. The method of claim **1**, wherein the one or more groups comprise users of the social networking service in a user-modified list of other users.

3. The method of claim **1**, wherein the one or more selectable filters include one or more content filters that specify a type of content from the received content items.

4. The method of claim **3**, wherein one of the content filters specifies one or more photos.

5. The method of claim **3**, wherein one of the content filters specifies one or more videos.

6. The method of claim **3**, wherein one of the content filters specifies text updates.

7. The method of claim **3**, wherein one of the content filters specifies one or more hyperlinks.

8. The method of claim **3**, wherein one of the content filters specifies content from an application within the social networking service.

9. The method of claim **1**, wherein the content feed includes a subset of recent content items provided by other users to whom the user has a connection.

10. The method of claim **9**, wherein the content items in the content feed are organized in reverse chronological order.

11. The method of claim **9**, wherein the content items in the content feed are displayed as comments from the users who provided the content items.

12. The method of claim **1**, wherein the content items in the highlights feed are organized at least in part by an affinity between the particular user and the content item.

13. The method of claim **1**, wherein the content items in the highlights feed include stories about actions taken by other users.

14. The method of claim **1**, wherein at least one of the content feed and the highlights feed further includes advertisements.

15. The method of claim **1**, wherein: the user interface comprises a composer interface that enables the user to upload content items to the social networking service.

16. The method of claim **15**, wherein the composer interface enables the user to upload a plurality of types of content items, the method further comprising:

responsive to selection of a filter specifying a type of content, updating the composer interface to facilitate uploading of the type of content specified by the selected filter.

17. The method of claim **1**, wherein the user profile attributes comprise attributes selected from a group consisting of geographic location, employer, job type, age, music preferences, and interests.

18. A method comprising:

receiving content items generated by users of a social networking service;

receiving, from the users of the social networking service, user profile attributes comprising descriptive information about each user;

receiving a request for information from a user of the social networking service;

automatically creating, by a processor, groups relevant to the user according to one or more rules, the groups comprising users of the social networking service having one or more common user profile attributes in common with the user;

providing a user interface for presentation to the user responsive to the request, wherein the user interface comprises:

a content feed that includes a subset of the content items provided by other users,

a highlights feed that includes a subset of content items selected by the social networking service as a function of affinity scores between the user and the content items of the highlights feed, and

one or more selectable filters generated by the social networking service for the user, each filter specifying one or more of the automatically created groups of users;

receiving, from the user, a selection of a filter of the one or more selectable filters, the selected filter associated with one or more groups of users; and

responsive to the selection of the filter, sending for presentation to the user in the user interface updated subsets of content items for the content feed and the highlights feed, the updated subsets including only content items received from the users in the one or more groups of users associated with the selected filter.

19. The method of claim **18**, wherein the user interface further comprises a composer interface that enables the user to upload a plurality of types of content in the social networking service.

20. The method of claim **19**, further comprising: responsive to the selection of a filter specifying a type of content, updating the composer interface to facilitate the uploading of the type of content specified by the selected filter.

21. The method of claim **19**, wherein the one or more selectable filters comprises one or more content filters that identify a type of content from the received content items.

22. The method of claim **18**, wherein sending the updated subsets of content items for the content feed and the highlights feed comprises:

selecting updated content items for presentation in the highlights feed based at least in part on an affinity score between the updated subset of content items for the highlights feed and the updated subset of content items for the content feed.

23. The method of claim **18**, wherein the affinity score reflects a strength of interest between a node of the social networking service and an additional node of the social networking service, the strength of interested determined based at least in part on previous interactions associated with the node and the additional node.

24. The method of claim **23**, wherein the node of the social networking service and the additional node of the social networking service are each selected from a group consisting of:

a user of the social networking service, an entity of the social networking service, and a content item of the social networking service.

25. A computer system comprising:

a processor;

a non-transitory computer-readable medium comprising computer program code executable by the processor to provide modules comprising:

a communications module configured to receive a plurality of content items and user profile attributes from users of the social networking service, user profile attributes comprising descriptive information about each user;

a user interface generating module configured to provide a user interface to a user of the social networking service via the communications module, the user interface comprising:

a content feed that includes a subset of the content items provided by other users,

a highlights feed that includes a subset of content items selected by the social networking service as a function of an affinity score between the user and other users of the social networking system associated with content items of the highlights feed, and

one or more selectable filters generated by the social networking service for the user, each filter specifying one or more groups of users of the social networking service, the groups including one or more users from whom content items were received, the groups automatically created by the social networking service according to one or more rules based on at least one common user profile attribute of the one or more users in the groups;

wherein the communications module is further configured to receive a selection of one or more filters from the user, the one or more selected filters associated with one or more groups of users, and

wherein, responsive to the selection of the filter, the user interface generating module is further configured to send for presentation to the user in the user interface updated subsets of content items for the content feed and the highlights feed, the updated subsets including only content items received from the users in the one or more groups of users associated with the selected filter.

26. The system of claim **25**, wherein the one or more selectable filters comprises one or more content filters that identify a type of content from the received content items.

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